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"..... per litora spargite museum,
Naiades, et circum vitreos considite fontes:
Pollice virgineo teneros hic carpite flores:
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas;
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Dææ pelagi, et pingui conchylia succo."
N. Parthenii Giannettasi Ecl. 1.

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I.—*A Preliminary Notice of a Stalked Bryozoon (Ascorhiza occidentalis).* By J. WALTER FEWKES.

[Plate I.]

THE number of genera of Bryozoa which people the waters of the coast of California is very great, and their study is a most fertile field for research. While there seems to be a great difference in the Bryozoon fauna of the Atlantic and Pacific shores of the United States, we find many genera common to both.

In an investigation of the marine Invertebrata, carried on at Santa Barbara*, my attention was turned to the great variety in the forms of Bryozoa which inhabit the Santa Barbara Channel. Many of these animals there grow to a large size and are sometimes found in huge masses, which are known as corals to the few fishermen who sail on these waters.

* I am indebted to Mr. Augustus Hemenway, of Boston, Massachusetts, for opportunities of carrying on studies in marine zoology on the coast of California.

A report on the Invertebrata collected on the coast of California, in which a more extended account of *Ascorhiza* will appear, will soon be published for me in the 'Bulletin' of the Museum of Comparative Zoology at Cambridge, Massachusetts.

In dredging just outside the zone of kelp in this channel there was brought up by the dredge a most exceptional genus of Bryozoa, which seems to me to present more than usual interest to students of the morphology of this group of animals. For this strange organism the name *Ascorhiza* is proposed.

The most marked peculiarity of the genus is the massing of the zoarium into a spherical or oval capitulum *, mounted on a jointed stem, which is flexible and highly sensitive to the touch (Pl. I. fig. 1). While it cannot be said positively that the specimen here described is an adult, and although there are several features which remind one of an immature animal, I am confident that a similar Bryozoon has never been described from the Atlantic sea-board of the United States and that nothing like it is recorded from European seas.

The following description of *Ascorhiza* may give an idea of its external form and exceptional anatomy.

Ascorhiza occidentalis, gen. et sp. nov.

Ascorhiza was dredged † in 20 fathoms of water in the channel off the island of Santa Barbara. While examining a small rock brought up in the dredge there was detected upon it an organism which had the form of a small sac mounted on a slender stalk. I was at first at a loss to know whether the organism was an animal or a plant. Its colour is almost identical with that of the huge kelp so abundant at Santa Barbara ; but when put into a glass vessel and irritated with a needle it was seen to sway slowly backwards and forwards and even to double its stem on itself. A study of the specimen with a hand-lens told the true story of its animal affinities.

It is believed to be a new genus allied to certain Bryozoan genera, some of which occur in shallow seas, some in the deep oceans, and one at least in fresh water.

The whole animal is about an inch in height and has the form of a fleshy globular sac mounted on a stem (fig. 1, s). The colour is a brownish red and is uniform throughout ‡.

* Mr. R. Kirkpatrick has suggested the term "capitulum" for this club-shaped structure. I am indebted to him for several valuable suggestions in the preparation of this account of *Ascorhiza*.

† The shore of the Pacific at Santa Barbara is lined by a broad zone composed of the huge fronds of a giant Alga. This zone is situated several hundred feet from the shore and marks the inner limit of shallow-water dredging. Between the inner edge of this zone and the shore it is next to impossible to dredge.

‡ The colour closely approximates to that of the giant kelp (*Macrocystis*).

The capitulum (fig. 1, *b*) is ovate, fastened to the stem at one pole and carried with its longest axis upright. Its surface is almost smooth or covered with small warts, but without marked elevations to denote the presence of the polypides. When kept in confinement it was impossible for me to get the wary polypides to extend themselves, and the openings on the surface of the body through which they could be extended were very difficult, or almost impossible, to discover. The wall of the capitulum is leathery, and through it extend delicate, pink-coloured, anastomosing fibres or threads (fig. 4). There are also many small yellow pigment-spots in its substance. The leathery covering of the capitulum, during life, is translucent. The polypides were easily found by a dissection of the capitulum of the Bryozoon. After many trials and repeated observations, in which it was impossible to see the polypides extended, incisions were made with the scalpel into the substance of the body, and the live polypides were found nicely packed away in its interior.

Each polypide (fig. 2) has a sac-like body fastened to the common attachment. The mouth is situated at the free end and is surrounded by a circle of tentacles. Many of the polypides seem to have their tentacles extending inwards, the mouth-openings pointing to the middle of the body.

I searched in vain for polypides on the stem; they seem to be confined to the body in all cases and to be absent from the stem. Each polypide has a transparent outer wall, with yellow-and-brown coloured stomach. At the base of the stomach there is a globular mass of unknown homology. The mouth-opening is entire and without cover. The tentacles are long, stiff, and not contractile, but are readily moved in all directions. Each tentacle has a central cavity and its outer wall is richly ciliated externally. They move very rapidly and often twist themselves into coils. Their manner of movement, ciliation, and stiffness recall the motion of tentacles of other well-known Bryozoan genera; but they have only a very remote likeness to the tentacles of the Hydrozoa.

Through the outer wall of the capitulum many wheel-like structures (fig. 3) were observed, which looked like immature polypides with their tentacles drawn together in such a way as to give a radiated appearance to these structures. These bodies are thought to be polypides with their tentacles par-

This resemblance, and the fact that it is found associated with small specimens of the Alga and among the "roots" of large specimens, may readily be interpreted to signify a protective resemblance.

tially developed. They are closely pressed together, especially near the lower pole, and seem to fill almost the whole interior of the capitulum.

The stem is of exceptional character and its structure in this genus of Bryozoa is believed to be unique. It consists of a long peduncle of uniform diameter fastened at one end to a foreign body, supporting at the free end the capitulum or colonial body of the animal. Like the body it also has a leathery character, and both have the same colour. The stem is carnose and composed of a number of segments of uniform size (fig. 6), the partitions or indentations between which are well marked.

The stem is very flexible and may be so bent as to bring the capitulum to the level of the attachment of the stem, forming a perfect coil or bow. It is sensitive to the touch and responds quickly when pinched or when in any way irritated. Its motion is always slow and graceful.

The stem is without appendages or lateral branches. Its basal joint is slightly expanded as a means of attachment; but the remaining segments are of uniform size.

The outer layer of the stem is translucent, pale brown, or amber-coloured. Through this superficial layer a number of longitudinal muscular blocks or cubes can be observed. The superficial fibres of these muscular blocks can also be easily seen. As the stem contracts the articulations of these blocks are more evident than when the stem is extended. The blocks of the stem near the body are polygonal and sometimes almost spherical. The indentations which mark the separate nodes of the stem are not the same nor do they correspond with those which limit the muscular blocks. The articulation is confined to the external layer of the stem, while the length of the muscular blocks does not correspond with the breadth of the articulations of the stem itself.

As in the genus *Acyonidium*, when the polypides are retracted they are wholly drawn out of sight beneath the gelatinous or carnose cœnosarc, and the tentacles are almost completely, if not wholly, hidden. This accounts for the fact that I have never seen the polypides extended beyond the cœnosarc of the body.

What are the zoological affinities among Bryozoa of the genus *Ascorhiza*?

The carnose body recalls that of *Acyonidium*, although it must be confessed that no adult Ctenostomatous Bryozoon has yet been described with a stalk similar to the stem of *Ascorhiza*.

Ascorhiza differs also from the Entoproctous genera *Pedi-*

cellina, *Loxosoma*, and *Urnatella* in its colonial character. It is not difficult, however, to see how we might find among known genera a homologue of the capitulum of *Ascorhiza* in the freshwater genus *Urnatella* described by Dr. Leidy.

The polyp-head of *Urnatella* may be supposed in *Ascorhiza* to be greatly enlarged and concentrated, so that the polypides are all brought together into a head or capitulum. We might then find in the stem of the *Ascorhiza*-colony the exact homologue of the articulated or jointed stem of *Urnatella*.

While, however, *Ascorhiza* differs from all known Entoproctous Bryozoa in the colonial form of the capitulum and the clustering of many zoecia in a compact mass, as in the Ctenostomata, we may look among the Entoprocta for a homologue of the stem. The stem of *Urnatella* closely resembles that of *Ascorhiza*, judging from the figures given by Dr. Leidy.

In *Ascopodaria* likewise, as figured in the Report on the 'Challenger' Bryozoa by Busk, we have at the base of the peduncle a barrel-shaped body, which in some particulars resembles the jointed stem of *Ascorhiza*. This barrel-like body forms a cup-shaped socket in which the base of the peduncle is placed, and lies at the very base of the peduncle. Its resemblance to the "jointed stem" of *Ascorhiza* is distant, for it is to be borne in mind that there is but a single zoecium on each peduncle in *Ascopodaria* and that the mouth and anus lie within the circle of the tentacles. The genus *Ascopodaria* has several remote resemblances to *Ascorhiza*.

A possible interpretation of the combination of features which we have in *Ascorhiza* is that the genus belongs to the Ctenostomata somewhere near *Alecyonidium*, but that it possesses what no genus of the Ctenostomata known to me has — a sensitive, flexible, jointed stem. It seems also probable that this stem is homologous with the stem of *Urnatella* and more distantly related somewhat to the barrel-shaped structure of the peduncle of *Ascopodaria*. If these comparisons are good and there is a true homology between the structures in question it is probable that we have in *Ascorhiza* a genus with characters of both the great orders or divisions of Bryozoa. So markedly different are the structural peculiarities of *Ascorhiza* and so characteristic is the stem that it may be necessary to make a new family for its reception.

From the limited knowledge of the anatomy of the polypides of *Ascorhiza* I am unable to refer it to either the Ctenostomata or the Chilostomata. In external form the colony is very different from anything found in either group. It is

very desirable that more should be ascertained of the structure of the polypides, as a study of their anatomy is necessary before the structural relations of the animal can be made out.

EXPLANATION OF PLATE I.

Fig. 1. View of *Ascorhiza* (entire). *a*, foreign body, to which the stem of *Ascorhiza* is attached; *b*, capitulum or club-shaped zoarium; *d*, brown bodies seen through the external walls of the capitulum; *s*, stem or stalk, showing its joints.

Fig. 2. Polypide of *Ascorhiza* (very much magnified).

Fig. 3. Two neighbouring polypides (young) with tentacles retracted.

Fig. 4. Single polypide with retracted tentacles, showing the network of tubes on the external surface of the capitulum.

Fig. 5. Distal end of the stalk adjoining the capitulum.

Fig. 6. Portion of the stalk, showing longitudinal muscles of two joints.

Cambridge, Mass., U. S. A.,
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II.—*Contributions to our Knowledge of the Crustacea of Dominica.* By R. I. POCCOCK, of the British Museum (Natural History).

[Plate II.]

THE Crustacea forming the subject-matter of the present paper were collected by Mr. G. A. Ramage, who has been engaged in the investigation of the fauna and flora of the Lesser Antilles for the West-Indies Exploration Committee.

In addition to the land and freshwater forms, which constitute the greater part of the collection, specimens of the following wide-spread Antillean and Central-American littoral species were sent home:—

Mithrax spinosissimus, Lamarck.

Carpilius corallinus, Herbst.

Grapsus maculatus, Catesby.

Cenobita diogenes, Latreille.

BRACHYURA.

Gecarcinus lateralis, Freminville.

Gecarcinus lateralis, Freminville, Milne-Edwards, Hist. nat. Crust. ii. p. 27, pl. xviii. fig. 1.

Eight specimens, collected near the sea on Point Michelle.